Conference on Effectively Restoring Ecosystems
22-24 August 2000, St. Louis, Missouri

BACKGROUND

Session: Breakout 1D
Topic: Engineer Research and Development Center (ERDC) Tools Overview
Moderator: Michael Passmore, PhD
Recorder: Trish Richardson, CPS
Panelists:

- Dave Mathis, PhD
- Elly Best, PhD
- Jim Wuebben
- Pat Guertin
- Rich Fischer, PhD
- Jean O'Neil, PhD

Objective: To provide an overview of the capabilities within ERDC of various evaluations and decision support tools applicable to ecosystem restoration planning.
Description: The session opened with an USACE Headquarters overview of ERDC technologies for restoration planning. Presentations included:
- Civil Works Innovative Technology
- Exploration of the Application Potential for Restoration Purposes of Environmental and Ecological ERDC Models to Aquatic Ecosystems
- Opportunities for Evaluating Genetic Diversity and Breeding New Plant Cultivars for Restoration Applications
- Ecological Dynamics Simulation Model (EDYS)
- Improving Riparian Buffer Strips and Corridors for Water Quality and Wildlife
- Ecosystem Management and Restoration Information System (EMRIS) for the Ecosystem Management and Restoration Research Program (EMMRP)

HIGHLIGHTS

Dave Mathis gave a presentation concerning Civil Works Innovative Technology. Included in his presentation were the FY00 Civil Works (CW) Research &Development (R&D) Funding, FY00 R&D Supporting CW Business Programs, and CW General Investigations R&D Funding. Also presented was the current alignment of the U.S. Army Engineer Research & Development Center along with the ERDC Concept. He discussed related research areas and recommended the following:

(1) Align R&D with CW Strategic Plan
(2) Establish Future Operating Capability Strategic Requirements Process
(3) Engage Major Subordinate Command's/Board of Directors in FOC and R&D Investment Planning
(4) Make Technology Transfer a Corporate Process

Elly Best's presentation was the Exploration of the Application Potential for Restoration Purposes of Environmental and Ecological ERDC Models to Aquatic Ecosystems. The distribution of submersed vegetation in shallow freshwater bodies is currently largely limited because of high turbidity of the water column. The presence of certain desired, submersed plants enhances transparency of the water column. Because of the varied roles of different plant species

in providing suitable habitat for epifauna, fish, and waterfowl, great benefit can be derived from the capability to predict presence, biomass, and compositional changes in macrophyte communities from environmental changes.

Jim Wuebben presented Opportunities for Evaluating Genetic Diversity and Breeding New Plant Cultivars for Restoration Applications. The U.S. Army Corps of Engineers is evaluating genetic diversity on military lands and breeding new plant materials to help the Department of Defense achieve its mission while minimizing disruption of the ecosystem. Working with Pennsylvania State University and U.S. Department of Agriculture, researchers are looking toward an integrated vegetation management approach to assess land-use intensity, environmental requirements, and the needs of plants to survive in a training-land environment. The goals of the research are (1) to better understand and evaluate genetic diversity on military lands, and (2) to breed new cultivars of existing range-land plants that will be better able to maintain healthy plant communities on training lands, while also increasing the morphological diversity of the ecosystem.

Pat Guertin presented Ecological Dynamics Simulation Model (EDYS). EDYS model is a PC-based mechanistic ecosystem model, which simulates changes in soil, plant, animal, and landscape components resulting from natural and anthropogenic ecological stressors. EDYS consists of climate, soil, plants, animal, stressor, spatial, and landscape modules. The EDYS core model is parameterized with data for each specific application. For a first approximation, these data can consist entirely of literature or other currently existing values. Increased accuracy in the output can then be achieved, if desired, by collection and application of site specific data, within an adaptive management process.

Rich Fischer presented Improving Riparian Buffer Strips and Corridors for Water Quality and Wildlife. Management and restoration of riparian zones has received considerable attention throughout the United States. Numerous studies have shown that riparian buffer strips of sufficient width protect and improve water quality by intercepting non-point source pollutants. Buffer strips also clearly provide a diversity of other functions, including movement corridors and habitat for a large variety of organisms. However, criteria for determining proper dimensions of buffer strips for most ecological functions are not well established. Although riparian zones are being restored along thousands of streambank miles throughout the country, the ecological benefits of variable buffer strip designs (e.g., width, length, vegetation type, placement within the watershed) have not been adequately recognized. There have been few systematic attempts to establish criteria that mesh water quality width requirements with other riparian functions. Subsequently, management prescriptions (e.g., width recommendations) are frequently based upon anecdotal information with little regard for the full range of effects these decisions may have on other riparian functions. Our objectives are to address the suitability of riparian zones to protect water quality while enhancing biodiversity, and to discuss recent advances in providing improved guidance for corridor and buffer designs based primarily on ecological criteria.

Jean O'Neil presented EMRIS – An Integrating Decision Support Software Product for Ecosystem Planning. As the knowledge base for ecosystem management and restoration expands, the need for effective and rapid information transfer and decision support becomes increasingly more important. A work unit in the Ecosystem Management and Restoration Research Program (EMRRP) is funding a computer-based decision support and information system that allows rapid access to information on a variety of environmental analyses and

ecosystem management strategies. EMRIS is designed for all elements of the Corps community. Its intent is to assist in planning Continuing Authority projects, including ecosystem concerns in traditional projects, conducting natural resources management in an ecosystem context, and making regulatory decisions in a holistic perspective. As our knowledge base continues to expand, EMRIS will be updated and enlarged. User feedback will be important in making this system as useful as it can be in supporting Corps initiatives in ecosystem management and restoration.